

AUSTRALIAN NEUROPTERA. PART II.

BY ESBEN-PETERSEN, Silkeborg.

(Plates vi.-xiii.; and two text-figs.)

(Communicated by W. W. Froggatt, F.L.S.)

In the following notes, which may be looked upon as preliminary ones only, I hope to give a contribution to the knowledge of the Australian fauna of Myrmeleonidæ. Unfortunately, I have not been able to work out the two large genera *Myrmeleon* and *Formicaleon*, so that lack of material necessitates the postponement of this work until more material is at hand.

My best thanks are due to the Government Entomologist, Mr. W. W. Froggatt, and to my friend, Mr. R. J. Tillyard, for loans and gifts of material.

TABLE OF GENERA OF AUSTRALIAN MYRMELEONIDÆ.

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| 1. In the hindwing, only one crossvein (rarely two) before the origin of the radial sector | 2. |
| In the hindwing, three or more crossveins before the origin of the radial sector | 12. |
| 2. No spurs. | 3. |
| Spurs present | 5. |
| 3. In the forewing, 1A runs directly into the hindmargin. M and Cu ₁ unite before tip of wing..... | <i>Chrysoleon</i> Bks. |
| In the forewing, Cu ₂ and 1A unite before margin. M and Cu ₁ run separately into the margin of the wing. | 4. |
| 4. Legs rather stout. In the forewing, C forks at the origin of radial sector | <i>Gymnocnemis</i> Schn. |
| Legs long and slender. In the forewing, C forks much beyond origin of radial sector, always at origin of first branch of radial sector..... | <i>Froggattisca</i> mihi. |
| 5. Basal joint of tarsi longer than apical one. In the forewing, Cu ₂ runs parallel to Cu ₁ for some distance..... | 6. |
| Basal joint of tarsi shorter than apical one. In the forewing, Cu ₂ does not run parallel to Cu ₁ | 7. |
| 6. Some of the crossveins in the costal area of the forewing united (two series of cells); the bent branches of radial sector in forewing form, or tend to form, a straight line through the apical part of wing. In hindwing, several rows of cells between Cu ₁ and hind margin.... | <i>Protoplectron</i> Gerst. |

- In the forewing, the crossveins in the costal area are simple, the branches of radial sector not forming any straight line. In hindwing, two rows of cells between Cu_1 and hind margin.....
.....*Pseudoformicaleo* Weele.
7. Spurs as long as, or longer than, first four tarsal joints together.....
.....*Distoleon* Bks.
- Spurs shorter than first four tarsal joints together..... 8.
8. Hind margin of the wings excavated; wings with lustrous markings...
.....*Periclystus* Gerst.
- Hind margin of the wings not excavated; wings without lustrous markings..... 9.
9. Legs short, stout and strongly haired. Spurs strongly curved, and as long as the first three tarsal joints together.....*Formicaleo* Bks.
- Legs rather long and slender, not strongly haired. Spurs shorter than the first three tarsal joints together..... 10.
10. Abdomen long and slender, especially in δ . In forewing, Cu forks before origin of radial sector.....*Macronemurus* Costa.
- Abdomen of usual size. In forewing, Cu forks beyond the origin of radial sector..... 11.
11. Wings long and narrow. Legs very slender. Each of second, third, and fourth tarsal joints longer than broad. Spurs nearly as long as first and second joints united.....*Dendroleo* Br.
- Wings broad or rather broad. Legs rather stout (when slender, the wings are very broad). Second, third, and fourth tarsal joints not longer than broad. Spurs a little longer than first joint.....
.....*Glenoleo* Bks.
12. Legs stout, short, and strongly haired. The bent branches of radial sector form a straight line through the middle of the apical part of wings.....*Acanthacclisis* Rbr.
- Legs rather slender, haired. No straight line through the middle of the apical part of wings 13.
13. In both wings, M and Cu_1 unite long before tip of wings.....
.....*Callistoleon* Bks.
- M and Cu_1 do not unite*Myrmelion* L.
- The Malayan genus *Episalus* Gerst., is not included in this Table.

ACANTHACLISIS.

Rambur, Hist. Nat. Ins. Névr., p.378(1842).

The Australian species of this genus differ from the European African ones in regard to the shape of the spurs. In *Acanthacclisis occitanica*, *A. bætica*, and *A. distincta*, the basal part of the spurs is broad, nearly straight; and forms, together with the

pointed apical part, almost a right angle. In the Australian species, *A. subtendens*, *A. fundata*, *A. fulva*, *A. subfasciata*, *A. maclachlani*, and *A. annulata*, the spurs have no broad basal part, and they are more or less gradually curved, not angular. *A. subtendens*, *A. fundata*, *A. fulva*, and partly also *A. subfasciata*, agree with the *A. occitanica*-group as to the shape and neuration of wings, the strongly haired and short legs, the length of tarsal joints, and the habitual appearance.

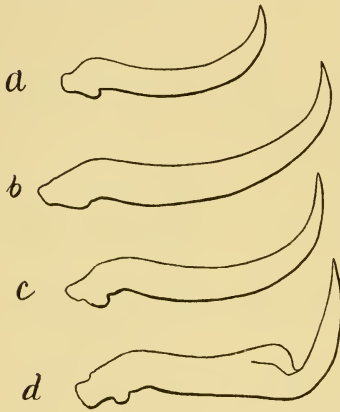


Fig. 1.—Internal spur of left tibia, seen from inner side, in: a, *A. annulata*; b, *A. subtendens*; c, *A. fundata*; d, *A. betica*.

A. maclachlani and *A. annulata*, however, differ with regard to their longer and narrower wings, their shorter spurs, and their relatively longer tibiae and tarsal joints. In the neuration of wings, there are also differences. Navás has founded a new genus, *Cosina*, including *C. maclachlani* and *C. neozelandica* (the latter unknown to me); but it seems to me, that the generic characters mentioned by him are not satisfactory. I think, for the present, that it will be preferable to retain the Australian species in *Acanthacლის*, and place them in two groups: the *A. fundata*-group, and the *A. maclachlani*-group.

- Below, I give a Table of the Australian species known to me.
1. In the hindwing, 6-8 crossveins before origin of radial sector. Cu_2 runs into hind margin of hindwing opposite to, or behind, origin of radial sector (*A. fundata*-group)..... 2.
 - In the hindwing, 11-16 crossveins before origin of radial sector. Cu_2 runs into the hind margin much before origin of radial sector (*A. maclachlani*-group)..... 5.
 2. Forewing with four rather indistinct transverse bands...*subfasciata* Bks. No transverse bands on forewing..... 3.
 3. Length of forewing at least 70 mm ; nervature yellowish-red and black *fulva* Esb-Pet.
 - Length of forewing not 50 mm.; nervature yellowish-white and black 4.

4. Cubital area in the forewing (the space between the stem of C_1 , the Cu_2 , and the first anal vein) with only one row of cellules (exceptionally, two rows are indicated). Cu_1 and Cu_2 proportionately wide apart. The line formed by bent branches from Cu_1 rather indistinct.....
 *fundata* Walk.

Cubital area in the forewing with two rows of cellules in its middle. Cu_1 and Cu_2 not wide apart. The line formed by bent branches from Cu_1 distinct and straight..... *subtendens* Walk.

5. Thorax above with only two small yellowish spots on mesoscutellum. Abdomen with narrow, yellowish, transverse bands.....
 *maclachlani* Weele.

Thorax above with large yellowish spots. Abdomen with broad, yellowish, transverse bands..... *annulata*, n.sp.

ACANTHACLISIS ANNULATA, sp.nov. (Plates vi., fig.1; vii., fig.9.)

Face and labrum yellowish; labial and maxillary palpi yellowish; apical joint of labial palpi brown exteriorly; above the antennæ, (which are lost) a transverse blackish-brown streak. Vertex blackish-brown, touching the transverse streak in its middle, and with some indistinct pale spots; above the transverse streak and close to each of the eyes, a yellowish triangular spot. Vertex rather raised. Prothorax hardly as long as broad, trapezoid, brownish-black, with four yellowish spots along the front margin; four triangular, transversely placed, spots in the middle; hind margin yellowish, abrupted in the middle. Along the side margins, long white and black hairs. Mesothorax brownish-black, with four large yellowish spots, and some small and indistinct ones, along the front and lateral margins. Metathorax brownish-black, with five yellowish spots. Meso- and metathorax whitish-haired. First abdominal segment above, black; second black, with narrow yellowish front margin and broader hind margin; third to sixth black, with broad yellow front, and hind margin; seventh and eighth black, with yellow posterior half; ninth brownish-black, with yellowish forceps, which are nearly as long as seventh and eighth segments united. Forceps provided with long blackish hairs exteriorly, and with strong, blackish, basally directed bristles interiorly.

Wings long and narrow, with acute tips. Longitudinal nervures yellowish white or yellowish-red, blackish-banded. Crossveins mostly blackish, broadly blackish-shaded. In the

hindwings, 11 crossveins before origin of radial sector. Cubital area in the forewing with two rows of cellules in its middle.

Length of forewing, 45-50; of hindwing, 43-46 mm.

Southern Cross, W. Australia; one male (type), 1912, W. W. Froggatt (Coll. Froggatt)—Broken Hill, N.S.W.; one male (Coll. Tillyard).

ACANTHACLISIS MACLACHLANI.

v.d. Weele, Notes Leyd. Mus., xiv., p.210(1904).

I have seen two males of this species, one from Bernier Is., N. W. Australia, (W. W. Froggatt leg.) and one from Port Darwin (Dodd leg.). In one specimen, the membrane of the wings is almost quite hyaline, and the veins indistinctly shaded with brown; in the other specimen, the membrane of the forewings gets a brownish-black aspect from the broadly marginated veins. Thorax and abdomen are blackish-brown. Mesoscutellum with two small, but distinct yellowish spots. Abdominal segments above with narrowly yellowish hind margin. In the hindwing, 16-17 crossveins before origin of radial sector. Cubital area in forewing with two rows of cellules in its middle part.

Type in Mus. Leyden.

ACANTHACLISIS SUBFASCIATA. (Plate xiii., fig.27.)

Banks, Proc. Ent. Soc. Wash., xv., p.141(1913).

This species is easily recognised by its banded forewings. The intercubital area in forewings acutely angulated basally; the cubital area narrow and long, with one row of cellules.

I have seen one specimen from North Queensland (Dodd leg.).

ACANTHACLISIS FULVA.

Esbén-Petersen, Ent. Mitt., i., p.269(1912).

No doubt this species is the largest in the genus, the forewing measuring 72 mm., and the hindwing 69 mm.

Nervures reddish-yellow, and black-banded. Eight to eleven crossveins at the base of costal area of forewing, simple. In hindwing, 8 crossveins before origin of radial sector. Cubital area in forewing with two irregular rows of cellules. Cu_1 and Cu_2 wide apart.

Type from North Queensland (Coll. Esb.-Petersen).

ACANTHACLISIS FUNDATA. (Plate vii., fig.8.)

Myrmeleon fundatus Walker, Cat. Neur. Ins. Brit. Mus., p.320 (1853).

The habitual structure of this species similar to that of *A. occitanica*; the main difference is found in the shape of the spurs. The broad, black, median streak on thorax hardly divided by any pale longitudinal line. Abdomen blackish. The cubital area in the forewing with two rows of cellules in its middle. Cu_1 and Cu_2 not wide apart, *i.e.*, the intercubital area acutely angulated basally. The line formed by bent branches from Cu_1 straight and distinct. R and Cu_1 with broad black bands.

I have seen specimens only from New South Wales, W. W. Froggatt leg. (Coll. Froggatt); and from Broken Hill (Coll. Esb.-Petersen).

ACANTHACLISIS SUBTENDENS. (Plate vii., fig.7.)

Myrmeleon subtendens Walk., Cat. Neur. Ins. Brit. Mus., p.321 (1853).

Acanthaclisis conspurcata Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, p.5(1885).

The broad median streak on thorax divided by a narrow pale line. Abdomen more or less brownish above, with a blackish median streak. The line formed by bent branches from Cu_1 indistinct. In strongly marked specimens, a row of rectangular dark spots in the subcostal area in both pairs of wings; a row of oblong spots in the median area (the space between M and Cu_1) of the forewing; and sometimes, also, a spot where Cu_2 runs into the hindmargin. In the hindwing, the apical crossvein between M and Cu_1 is often dark-shaded.

I have seen two females from Cape York; 20 x. 1908; W. W. Froggatt leg. (Coll. Froggatt); and one male, North Queensland (Coll. Petersen).

I have not seen the types of Walker's above-mentioned species; the specimens before me have been determined from the descriptions only; and, on that account, it is possible that my identification may be wrong. I am quite sure, however, that we have two closely allied but distinct species.

I regard *A. conspurcata* Gerst., as a synonym of this species, although v.d. Weele, who has seen Gerstaecker's type, refers it

to *A. fundata* (Notes Leyd. Mus., xx., p.60, 1908). Probably v.d. Weele regards *A. fundata* and *A. subtendens* as one species.

CALLISTOLEON.

Banks, Ann. Ent. Soc. Amer., p.42(1910).

Wings hyaline, with brownish-black spots. In forewing, 1A ends before origin of first branch of radial sector; in hindwing, before origin of radial sector. About seven crossveins before origin of radial sector in forewing, four or five in hindwing. Crossveins in costal area simple. No straight line formed by bent branches of radial sector in apical part of wings. M and Cu₁ unite before the tip of the wings. Legs short, and rather stout; first tarsal joint a little longer than second; second, third, and fourth of about the same length; fifth twice the length of first; spurs as long as first and second joints united. Front part of vertex much raised.

Type: *Myrmeleon erythrocephalum* Leach, (*M. guttatus* Rbr.).

The two Australian species known to me may be separated as follows:—

- Wings rather broad, with large spots along front margin of forewing.
 Head entirely reddish-yellow..... *erythrocephalum* Leach.
 Wings slender, smaller spots along front of forewing in its apical part.
 Vertex blackish-brown..... *illustre* Gerst. (Pl. viii., fig. 10.)

MYRMELEON.

Linné, Syst. Nat., xii., p.913(1767).

MYRMELEON DIMINUTUS, sp. nov. (Plates vi., fig. 2; viii., fig. 11.)

Head yellow. Tip and inner margin of mandibles brown. Palpi yellow. Apical joint of labial palpi fusiform, brown on exterior side. Above antennæ, a brown crossband; between the antennæ, a narrow brown line. Vertex with several brown spots. Antennæ rather short and stout, yellowish, a little darker towards apex; the extreme tip brown; apex of the two basal joints broadly brown, of the following joints narrowly brown below. Prothorax yellowish, a little broader than long, with a brown median stripe, and two shorter lateral ones; meso- and metathorax with several greyish-brown dots and streaks [abdomen lost]. Legs yellowish, blackish-brown haired; tarsal joints blackish at

the tips. Spurs hardly as long as basal joint. Wings hyaline. Veins yellowish, brownish-banded except costa and radius. Most crossveins brown on their front half. Pterostigma greyish-yellow. In forewing, seven crossveins before origin of radial sector; in hindwing, five or six.

Length of forewing, 18 mm.; of hindwing, 16.5 mm.

Broken Hill, N.S.W.; two specimens; type in Coll. Tillyard, cotype in Coll. Esb.-Petersen.

G Y M N O C N E M I A .

Schneider, Ent. Zeit. Stettin, vi., p.343(1845).

No spurs. Legs rather short, strongly haired; tarsi almost as long as tibiae. Fifth tarsal joint the longest; first as long as second and third united; fourth the shortest. Wings very long and narrow; forewing rather longer than hindwing. In hindwing, one crossvein before origin of radial sector; in forewing, three or four. Branches from radial sector and from Cu_1 bent, so that they form straight lines.

Species known from Australia: *G. tipularia* Gerst.; *G. pentagramma* Gerst., *G. interrupta*, n.sp., and *G. bipunctata*, n.sp.

In the two species here described, is a very small rudiment of a single spur on each leg, but it is only visible by large magnifying.

G Y M N O C N E M I A B I P U N C T A T A , sp.nov. (Plates vi., fig.3; ix., fig.13.)

Face yellowish. Palpi yellowish, apical joint dark brown. A broad blackish-brown interantennal spot enclosing the insertion of antennæ; above this band, a reddish-yellow band, and then a blackish band, both in front of the much elevated vertex. On the top of the vertex, several reddish-yellow and blackish spots. Antennæ rather long, blackish-brown, with yellowish-brown annulations at the joints. Prothorax longer than broad, narrowed in front, with rounded front angles, and with three interrupted yellowish-red streaks, which continue on the blackish meso- and metathorax. Abdomen dorsally blackish, with short whitish hairs, ventrally testaceous. Legs testaceous; hind tibiae with blackish apex; fore and intermediate tibiae with blackish tip, and two narrow blackish bands on the exterior side; tarsal joints testaceous, with blackish tip. Wings long and slender,

with acutely rounded tips. Longitudinal nervures whitish, broadly blackish-brown banded. Some of the crossveins brownish-black shaded. In the hindwing, a large brown spot at the end of M and Cu₁. Two rows of cellules in the cubital area of forewing.

Length of forewing, 21 mm.; of hindwing, 17 mm.

Narromine, N.S.W.; two specimens, 14.x.1905 (W. W. Froggatt leg.); Broken Hill, N.S.W.; one specimen.

Type in Coll. Froggatt; cotype in Coll. Tillyard.

GYMNOCNEMIA INTERRUPTA, sp.nov. (Plates vi., fig 4; viii., fig.12.)

Face yellowish; palpi brownish with pale joints. A broad black transverse band between the eyes, enclosing the insertion of the antennæ. The raised vertex yellowish-red, with blackish streaks and spots [antennæ wanting]. Prothorax greyish-black, with an indistinct pale median streak, and two very distinct yellowish-red streaks at each side. Meso- and metathorax greyish-black, with some yellowish-red spots. Abdomen black. Legs testaceous, with long black and white hairs. Hind tibiæ with a blackish band at tip and base; fore and intermediate tibiæ with a blackish band at the tip and base, and with two in their middle; tarsi blackish. Wings long and slender, with somewhat acute tips. Longitudinal veins whitish, mostly broadly blackish-brown banded. Crossveins whitish, mostly with one or two very small blackish-brown dots. In forewing, an abrupted longitudinal brownish-black streak along Cu₁, terminating at the tip of the wings; in the hindwing, a blackish-brown streak at the end of M and Cu₁. In the forewing, two rows of cellules in the middle of the cubital area.

Length of forewing, 18 mm.; of hindwing, 15 mm.

Coolebah, N.S.W.; one specimen, 16.ii.1907 (W. W. Froggatt leg.). Type in Coll. Froggatt.

FROGGATTISCA, gen.nov.

Antennæ long and slender. Prothorax and abdomen long and slender. Legs very long and slender. Femur and tibia of the same length. Fore-tarsus one-half the length of fore-tibia, hind-tarsus hardly half the length of hind-tibia. No spurs. Wings long

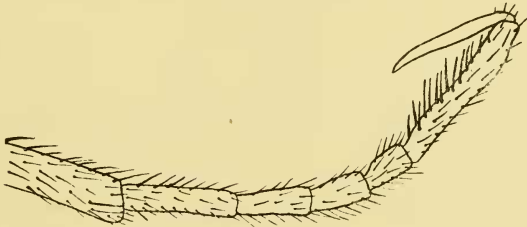
and slender, strongly marked; tip of hindwing somewhat falcate. Three crossveins before radial sector in forewing, one in hindwing. Origin of first branch from radial sector opposite to fork of Cu in both pairs of wings; 1A runs nearly parallel to the hind margin.

This genus is nearly allied to *Dendroleon* Brauer, but the absence of spurs, and its slender and strongly marked wings separate it from that genus.

Type: *Froggattisca pulchella*, sp.nov.

FROGGATTISCA PULCHELLA, sp.nov. (Plate ix., fig.14.)

Face and palpi yellowish; above the antennæ, a blackish-brown transverse band proceeding between the antennæ as a V-shaped spot. Above the transverse blackish streak, a narrow yellowish one. Vertex somewhat raised, bronze-brown. Eyes greenish, metallic, shining. Antennæ blackish-brown, the club blackish; two joints before the club very pale, nearly white. Prothorax reddish-brown, longer than broad, narrowed in front, and with rounded front angles. One-third from the front margin, a transverse impression. Meso- and metathorax greyish-brown, with



Text-fig.2.--Left foretarsus of *Froggattisca pulchella*.

narrow, whitish, hind margins. Abdomen reddish-brown, becoming blackish-brown towards apex. Fore and intermediate legs blackish-brown, hind femur brown, with a broad blackish band in its middle, and a narrower one at the tip; hind tibiae brown, with a blackish band near base and at tip; hind tarsus blackish, first joint brown at base. All the claws yellowish. Body and legs with soft pilosity. Wings hyaline, with brownish tinge in the disc, and sooty-brown markings. Longitudinal

nervures mostly yellowish; the greatest number of crossveins in the forewings strongly sooty-brown shaded.

Length of forewing, 35 mm.; of hindwing, 35 mm.

Colo Vale, N.S.W.; one female; 20.iv.1900; W. W. Froggatt leg.(Coll. Froggatt).

PROTOPLECTRON.

Gerstaecker, Mitt.naturw. Ver.f. Neuvorp. u. Rügen, p.15(1884).

Banks, Ann. Ent. Soc. Am., iii., p.40(1910).

Type: *P. venustum* Gerst.

Tibia short and stout, two-thirds the length of the stout and short femur; tarsus long and slender, longer than tibia. Basal joint of tarsus the longest, longer than second-fourth united, which, united, are of the same length as fifth. Spurs as long as first joint.

In the forewing, Cu_2 and 1A run parallel to Cu_1 for some distance. Some of the crossveins in the costal area of forewing united (two series of cells); the bent branches of radial sector in forewing form, or tend to form, a straight line through the middle of the apical part of the wing. In the hindwing, several rows of cells between Cu_1 and hind margin.

Table of Species.

All nervures yellowish *pallidum* Bks.

The nervures more or less marked with black..... *venustum* Gerst.

PROTOPLECTRON VENUSTUM. (Plate ix., fig.15.)

Gerstaecker, Mitt.naturw. Ver.f. Neuvorp. u. Rügen, p.16(1884).

Face below yellowish; palpi more or less brownish. A blackish cross-band below the eyes; vertex blackish-brown, with ill-defined pale brown markings. Prothorax longer than broad, reddish-brown, with an indistinct pale median line, and a pale longitudinal streak at each side, lateral margins blackish. Abdomen blackish-brown. Femora and tibiae brown and long-haired; hind tibiae yellowish, with black apex, and a narrow blackish band near base. Tarsi blackish. Wings with whitish membrane, pale, blackish-banded nervures, and many more or less brownish-shaded crossveins.

Length of forewing, 26 mm.; of hindwing, 25 mm.

New South Wales; one specimen; 14.x.1905; W. W. Froggatt leg.(Coll. Froggatt).

PSEUDOFORMICALEO.

v.d. Weele, Notes Leyd. Mus., xxxi., p.25(1909).

Tahulus Navás, Revue Russe d'Ent., xii., p.112(1912).

Tibiae short and stout, two-thirds the length of the stout and short femur; tarsus long and slender, longer than tibia. Basal joint of tarsus the longest, longer than second, third, and fourth united, which, together, are of the same length as fifth. Spurs as long as first joint. In forewing, Cu_2 and 1A run parallel to Cu_1 for some distance. Crossveins in the costal area of forewing simple. Branches of radial sector not forming any straight line. In hindwing, two rows of cells between Cu_1 and hind margin.

PSEUDOFORMICALEO NUBECULA. (Plate x., fig.16.)

Creagrís nubecula Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, p.18(1885).

Pseudoformicaleo jacobsoni Weele, Notes Leyd. Mus., xxi., p.25 (1909).

Protoplectron costatus Banks, Ann. Ent. Soc. Am., iii., p.41(1910).

Tahulus caligatus Navás, Revue Russe d'Ent., xii., p.113(1912).

I have seen one specimen from Australia, which undoubtedly belongs to the species of Gerstaecker; and, as far as I can see, it also agrees with the description of *P. costatus* given by Banks.

I have, in my collection, specimens of *Pseudoformicaleo jacobsoni* from Java, and *Tahulus caligatus* from Formosa; and I am undoubtedly right in regarding them as synonyms.

PERICLYSTUS.

Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, p.103 (1887).

Front part of vertex much raised. Wings hyaline, with brownish-black or golden shining spots or bands. Hind margin of wing with two excavations, the apical one the deeper. Costal area rather narrow, with simple crossveins, from the pterostigma broader, and with forked crossveins. Five or six crossveins before origin of radial sector in the forewing, one in the hindwing. The somewhat bent branches of radial sector tend to form a straight line through the middle of the apical part of the wings. Legs slender; first tarsal joint about twice the length of second,

and about one-half the length of fifth; second, third, and fourth of almost the same length. Spurs slender, and as long as first and second tarsal joints united.

Type: *Periclystus laceratus* Gerst.

The two Australian species known to me may be separated as follows:—

Forewing with a nearly complete median crossband, and an irregular one before pterostigma; hindwing with a broad crossband before pterostigma.....	<i>circuiter</i> Walk.
No complete crossbands.....	<i>laceratus</i> Gerst.

PERICLYSTUS CIRCUITER. (Plate x., fig.17.)

Myrmeleon circuiter Walker, Cat. Neur. Ins. Brit. Mus., p.400 (1853).

Periclystus callipeplus Gerstaecker, Mitt. naturw. f. Neuvorp. u. Rügen, p.107(1887).

Of this species, I have an old specimen in my collection, from Cairns, Queensland. It agrees very well with the description of *P. callipeplus*, and also with that of *M. circuiter*. I have sent a photo. of the specimen to the British Museum, and Dr. Meade-Waldo states that it agrees very well with the type-series of Walker. On that account, I place the name of the species of Gerstaecker as a synonym of that of Walker.

PERICLYSTUS LACERATUS. (Plate x., fig.18.)

Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, p.105 (1887).

Cape York, Queensland; one male; 20.x.1908(W. W. Froggatt leg.), Coll. Froggatt; Queensland; one female, Coll. Petersen.

The male is more slender, and has narrower wings, than the female; the excavations of the hind margin of the wings of the male are hardly so deep as in the female.

DISTOLEON.

Banks, Ann. Ent. Soc. Amer., p.42(1910).

Wings long and narrow, hindwing as long as forewing. Seven or eight crossveins before origin of radial sector in forewing, one in the hindwing. In forewing, the bent branches of the radial sector and Cu_1 tend to form straight lines through the apical part

of the wings. Spurs as long as first four tarsal joints, fifth much longer than first.

Type: *D. verticalis* Bks.

DISTOLEON BISTRIGATUS.

Myrmeleon bistrigatus Ramb., Hist. Nat. Ins. Névr., p. 391 (1842).
M. striola Walk., Cat. Neur. Ins. Brit. Mus., p. 340 (1853); *M. perjurus* Walk., *ibid.*, p. 340; *M. torvus* Walk., *ibid.*, p. 341; *M. violentus* Walk., *ibid.*, p. 348.

Of this wide-spread Australian species, I have seen one specimen from Queensland, in Coll. Froggatt; and several specimens from Oahu. I have seen also a very fine undescribed species from Australia.

FORMICALEON.

Banks, Ann. Ent. Soc. Amer., p. 16 (1911).

The genotype is *F. tetragrammicus* Fabr., in which the bent branches of the radial sector form a straight line through the middle of the apical part of the wing.

I call attention to the fact, that this line is wanting in some of the Australian species hitherto placed in this genus. These species may be placed in a new genus, and I propose the name *Alloformicaleon*, with *F. australis* Esb.-Pet., as genotype; but I will postpone giving a more complete description of the genus until more material is at hand.

FORMICALEON AUSTRALIS, sp. nov. (Plates vi., fig. 6; xi., fig. 19.)

Face and palpi yellowish. Below the antennæ, a blackish-brown streak. The vertex reddish-brown, raised, and with a slight median impression; on the hind part of the elevated vertex, two blackish indistinct spots. Round each eye, a narrow yellowish circle. Antennæ as long as head and thorax united, brown, with yellowish annulations at the joints; club blackish-brown at tip. Prothorax broader than long, reddish-brown, with three longitudinal yellowish streaks. Meso- and metathorax reddish-brown, with narrow yellowish hind margins. First segment yellowish above, with a dark brown median spot; second segment entirely dark brown; front half of third segment yellowish, with a dark brown median spot; hind part with a narrow yellowish

hind border; fourth, fifth, and sixth segments yellowish above, with a broad dark brown transverse band in their hind part; seventh and eighth dark brown, with yellowish hind border; ninth yellow. Venter of abdomen brown, with yellowish annulations at the joints. Legs yellowish, strongly blackish-haired; fore and intermediate tibiae anteriorly with some blackish spots; tarsi yellowish, the points with blackish tips. Spurs reddish, and nearly as long as first to third joints united. Wings long and narrow. Longitudinal nervures yellowish-white, blackish-banded. Several crossveins blackish and faintly blackish-brown shaded.

Fore- and hindwings, 30 mm. in length.

Sydney; two specimens; W. W. Froggatt leg. Type in Coll. Froggatt; cotype in Coll. Petersen.

DENDROLEON.

Brauer, Novara-Expedition, Neuroptera, p.42(1866).

Antennæ long and slender. Legs long and slender. Tarsus two-thirds the length of tibia. First tarsal joint longer than second, or third, or fourth, shorter than fifth; second, third, and fourth of the same length, each of them twice longer than broad. Spurs slender, nearly as long as first and second joints united. Wings long and rather narrow; costal crossveins simple, a few forked before pterostigma. Cu forks much beyond origin of radial sector; 1A and Cu₂ united before the margin. The bent branches of radial sector form a straight line through the middle of the apical part of the wing. Three or four crossveins before origin of radial sector in forewing, one in hindwing.

DENDROLEON LONGIPENNIS, sp.nov. (Plate xi., fig.20.)

Face yellowish. Maxillary palpi yellowish; fifth and base of third joint brownish. A broad blackish-brown streak between the eyes, enclosing the insertion of the antennæ. Vertex raised, reddish-brown, with two brownish-black, irregular, transverse streaks abruptly in the middle. Prothorax longer than broad, greyish-brown, blackish-haired; front angles rounded, and with yellowish border; two irregular pale longitudinal streaks, not reaching the front border, and a slight indication of a pale and

narrow median line. Meso- and metathorax dark greyish-brown, with a narrow yellow hind border. Abdomen pale greyish-brown. Legs testaceous, dark brown-haired; femora with a blackish band at tip, and with a long dark streak on the ventral side; tibiæ with a narrow blackish band at tip and base, and the foremost with a long dark streak on the upper side; tarsi blackish; spurs yellowish-red, and nearly as long as the two basal joints. Wings long and slender, with acute tips, whitish, black-banded, longitudinal nervures; crossveins mostly blackish, several of them brownish-shaded. Wings with some blackish-brown markings.

Length of forewing, 26 mm; of hindwing, 25 mm.

New South Wales; one specimen; W. W. Froggatt leg. (Coll. Froggatt).

GLENOLEON.

Banks, Trans. Amer. Ent. Soc., xxxix., p.223(1913).

Cu forks beyond origin of radial sector. Three or four crossveins before radial sector in forewing, one in hindwing. In forewing, 1A and Cu₂ unite before the margin. In the middle of the apical part of the wing, the bent branches of the radial sector form a straight line.

Type: *Myrmeleon pulchellus* Ramb.

Banks proposed this genus for the Australian species of *Glenurus* Hag., but the species placed in the genus, as it is restricted at present, form a rather heterogeneous group as to the form of the wings, and the length and slenderness of the legs and tarsal joints. In *G. indecisum* and *G. annulicorne*, we have very broad wings, with broadly rounded tips, slender and rather long legs and tarsal joints; in *G. pulchellum* and *G. dissolutum*, the wings are broad, with somewhat acute tips, and the legs and tarsal joints of usual size; in *G. falsum* and *G. meteoricum*, the wings are slender and narrow, and the legs and tarsal joints relatively stout, short, and strongly haired. With regard to the form of the wings, these two species are closely allied to the species of the genus *Dendroleon*, in which, however, the species have slender and relatively long legs, and tarsal joints as in the *G. indecisum*-group

I think that it will be necessary, when more material comes under consideration, to make a new arrangement of the species, which at present are placed in the two genera *Glennoleon* and *Dendroleon*.

The species known to me may be tabulated as follows:—

- | | |
|--|--|
| 1. Hindwings with distinct black spots..... | 2. |
| Hindwings without distinct black spots, only minute dots..... | 6. |
| 2. Hindwings with two complete crossbands in their apical part..... | |
| <i>pulchellum</i> Rbr. | |
| Not two complete bands..... | 3. |
| 3. In hindwings, four crossveins below radius are marked with black; a large spot at the pterostigma, and another opposite to it on the hind margin..... | <i>radiale</i> Bks. (Plate xii., fig. 24). |
| No marks along radius on hindwing..... | 4 |
| 4. A lunate crossband in the hindwing, from pterostigma to hind margin; its inner margin convex. Vertex black..... | <i>falsum</i> Walk. |
| No such band. Vertex reddish-yellow, with black spots and streaks...5. | |
| 5. Before pterostigma, in fore- and hindwings, a large black spot..... | |
| <i>dissolutum</i> Gerst. | |
| Only a minute spot..... | <i>meteoricum</i> Gerst. |
| 6. Antennæ with a broad yellow band at base, and near the club. Cu_2 , in forewing, straight..... | <i>annulicornæ</i> Esb.-Pet. |
| Antennæ without any broad band. Cu_2 , in forewing, somewhat curved. | |
| <i>indecisum</i> Bks. | |

I do not know *G. stigmatum* Bks., (Ann. Ent. Soc. Amer., p. 40, 1910) from Kuranda, but, judging from the description, it is closely allied to *G. dissolutum*.

GLENOLEON ANNULICORNE, sp. nov. (Plates vi., fig. 5; xiii., fig. 26.)

Face and palpi pale yellow; a broad, blackish, transverse band between the eyes, enclosing the insertion of the antennæ. Vertex reddish-yellow, with a few blackish spots. Antennæ blackish-brown, with pale annulations at the base; third joint as long as first and second united, pale yellow; three joints before the club pale yellow. Thorax dull black, with pale yellow streaks and spots, mostly on prothorax. Legs slender, brownish, with long dark bristles. Coxæ with one or two dark streaks exteriorly. Femora with a dark band at apex, and a yellowish-white one just before that. Fore and intermediate tibiæ with a dark band at apex, one in the middle, and one near base; hind tibiæ with a

dark band at apex. Second, third, and fourth tarsal joints blackish. Abdomen black, yellowish-spotted. Wings rather narrow, hind margin of apical part slightly incurved. Longitudinal nervures dark brown, with some whitish bands; crossveins mostly blackish-brown. Along radius and cubitus in forewings, brown dots. A brown dot where 1A joins Cu_2 . Two or three crossveins at the end of M and Cu_2 brownish-margined. Pterostigma indistinct; in the forewing, with a small brown spot before it.

Length of forewing, 22-23 mm.; of hindwing, 21-22 mm.

Victoria; one specimen (Coll. Esben-Petersen), the other not labelled. Type in Coll. West Australian Museum, Perth; cotype in Coll. Esben-Petersen.

This species has great likeness to *G. indecisum* Bks., from which it differs by the narrower wings, the more spotted abdomen, and the straight Cu_2 in the forewings. In *G. indecisum*, Cu_2 , in the forewing, is somewhat curved, and wide apart from Cu_1 .

GLENOLEON INDECISUM. (Plate xiii., fig.25.)

Banks, Trans. Amer. Ent. Soc., xxxix., p.225 (1913).

Mackay, Queensland; one specimen, 1905; R. Turner leg. (Coll. Froggatt).

GLENOLEON DISSOLUTUM. (Plate xii., fig.23.)

Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, xvi., p.26 (1884).

Prince of Wales Island; one specimen; H. Elgner leg. (Coll. Froggatt).

GLENOLEON FALSUM. (Plate xi., fig.21.)

Walker, Cat. Neur. Ins. Brit. Mus., p.303 (1853).

Blue Mountains, N.S.W.; one specimen; 20.viii.1901; W. W. Froggatt leg. (Coll. Froggatt).

GLENOLEON METEORICUM. (Plate xii., fig.22.)

Gerstaecker, Mitt. naturw. Ver. f. Neuvorp. u. Rügen, xvi., p.25 (1884).

Sydney; one specimen; W. W. Froggatt leg. (Coll. Froggatt).

EXPLANATION OF PLATES VI.-XIII.

Plate vi.

- Fig. 1.—*Acanthaclisis annulata*, n.sp.
 Fig. 2.—*Myrmeleon diminutus*, n.sp.
 Fig. 3.—*Gymnocnemia bipunctata*, n.sp.
 Fig. 4.—*Gymnocnemia interrupta*, n.sp.
 Fig. 5.—*Glenoleon annulicorne*, n.sp.
 Fig. 6.—*Formicaleon australis*, n.sp.

Plate vii.

- Fig. 7.—*Acanthaclisis subtendens* Walk.
 Fig. 8.—*Acanthaclisis fundata* Walk.
 Fig. 9.—*Acanthaclisis annulata*, n.sp.

Plate viii.

- Fig. 10.—*Callistoleon illustre* Gerst.
 Fig. 11.—*Myrmeleon diminutus*, n.sp.
 Fig. 12.—*Gymnocnemia interrupta*, n.sp.

Plate ix.

- Fig. 13.—*Gymnocnemia bipunctata*, n.sp.
 Fig. 14.—*Froggattisca pulchella*, n.sp.
 Fig. 15.—*Protoplectron venustum* Gerst.

Plate x.

- Fig. 16.—*Pseudoformicaleo nubecula* Gerst.
 Fig. 17.—*Periclystus circuiter* Walk.
 Fig. 18.—*Periclystus laceratus* Gerst.

Plate xi.

- Fig. 19.—*Formicaleon australis*, n.sp.
 Fig. 20.—*Dendroleon longipennis*, n.sp.
 Fig. 21.—*Glenoleon falsum* Walk.

Plate xii.

- Fig. 22.—*Glenoleon meteoricum* Gerst.
 Fig. 23.—*Glenoleon dissolutum* Gerst.
 Fig. 24.—*Glenoleon radiale* Banks.

Plate xiii.

- Fig. 25.—*Glenoleon indecisum* Banks.
 Fig. 26.—*Glenoleon annulicorne*, n.sp.
 Fig. 27.—*Acanthaclisis subfasciata* Banks.